

WE CLAIM:

1. A protein derived from an enterically transmitted non-A/non-B viral hepatitis agent whose genome contains a region which is homologous to a coding region of the 1.33 kb DNA EcoRI insert present in plasmid pTZKF1(ET1.1) carried in E. coli strain BB4 and having ATCC deposit no. 67717.

2. The protein of claim 1, which is encoded by a complete coding region within said 1.33 kb EcoRI insert.

3. A recombinant protein derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to a coding region of a DNA molecule having a first sequence (SEQ ID NO.1):

AGACCTGTCC CTGTTGCAGC TGTTCTACCA CCTGCCCCG AGCTCGAACA GGGCCTTCTC 60  
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCTGTA CATTGAATT AACAGACATT 120  
GTGCACTGCC GCATGGCCGC CCCGAGCCAG CCAAGGCCG TGCTGTCCAC ACTCGTGGG 180  
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCACT CTGATGTTTCG CGACTCTCTC 240  
GCCCCGTTTA TCCCGGCCAT TGGCCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA 300  
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC 360  
AACCGTGACG TGTCCAGGAT CACCTTCTTC CAGAAAGATT GTAACAAGTT CACCACAGGT 420  
GAGACCATTG CCCATGGTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC 480  
GCCCTCTTTG GCCCTTGTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG 540  
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA 600  
AAGGCATCCA TGGTGTTTGA GAATGACTTT TCTGAGTTTG ACTCCACCCA GAATAACTTT 660  
TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720  
CTGTATCACC TTATAAGGTC TGCCTGGATC TTGCAGGCCG CGAAGGAGTC TCTGCGAGGG 780  
TTTTGGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840  
GCCGTTATTA CCCACTGTTA TGACTCCGC GATTTTCAGG TGGCTGCCTT TAAAGGTGAT 900

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	GATTCGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC	960
	GGCTGTGGCT TGAAGTTGAA GGTAGATTTT CGCCCGATCG GTTTGTATGC AGGTGTTGTG	1020
5	GTGGCCCCCG GCCTTGGCGC GCTCCCTGAT GTTGTGCGCT TCGCCGGCCG GCTTACCGAG	1080
	AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTTT	1140
10	CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTATATGGG	1200
	GTTTCCCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG	1260
	GCACATTCA CTGAGTCAGT AAAACCAGTG CTCGA	1295
15	a second sequence (SEQ ID NO.5):	
	TCGAGCACTG GTTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC	60
	ATGCCAATCA GGTTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACACATCC	120
20	ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC	180
	TGCTCCGCC GCTCAGGGCC AGGGCCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC	240
25	ACAACATCAG GGAGCGCGCC AAGGCCGGGG GCCACCACAA CACCTGCATA CAAACCGATC	300
	GGGCGGAAAT CTACCTTCAA CTCAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA	360
	CTCTGACGAT ACTCACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA	420
30	AAATCGCGGA AGTCATAACA GTGGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA	480
	AGAGTGCCGG GCTCACCGBA GTGTTTCTTC CAAAACCTC GCAGAGACTC CTTGCGGGCC	540
35	TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA	600
	CACTCCTCCA TAATAGCACA CTCTAGACCC AGAGAAAAGT TATTCTGGGT GGAGTCAAAC	660
	TCAGAAAAGT CATTCTCAA CACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG	720
40	ACGGTGTGAT CAAAGGCATC ACCGTAAAC ACACCCTGAG GGAGCAGGGC CAGAATAGCC	780
	TTCTCAATAG CGCGGAACCA AGGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG	840
45	ATGCCCTGGC CCACTTTACC ATGGGCAATG GTCTCACCTG TGGTGAACCT GTTACAATCT	900
	TTCTGGAAGA AGGTGATCCT GGACACGTCA CGGTTGCAAA GATCAAGCTC AAGGACGGCG	960
	GAGCCATCCT GGCCCTTCTC GACCATGGCC TCCACTAGCT CGTACAATTC ACAAGTTGTA	1020
50	ACCTGTACGG GGCCAATGGC CGGGATAAAA CGGGCGAGAG AGTCGCGAAC ATCAGAGTGG	1080
	GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCCA CGAGTGTGGA CAGCACGGCC	1140
55	TTGCGCTGGC TCGGGGCGGC CATGCGGCAG TGCACAATGT CTGTTAATTC AAATGTTACG	1200

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	ACACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTTC GAGCTCGGGG	1260
	CAGGGTGGTA GAACAGCTGC AACAGGGACA GGTCT	1295
5	a third sequence (SEQ ID NO.6):	
	AGGCAGACCA CATATGTGGT CGATGCC ATGGAGGCC ATCAGTTTAT TAAGGCTCCT	57
	GGCATCACTA CTGCTATTGA GCAGGCTGCT CTAGCAGCGG CCAACTCTGC CCTGGCGAAT	117
10	GCTGTGGTAG TTAGGCCTTT TCTCTCTCAC CAGCAGATTG AGATCCTCAT TAACCTAATG	177
	CAACCTCGCC AGCTTGTTTT CCGCCCCGAG GTTTTCTGGA ATCATCCCAT CCAGCGTGTC	237
	ATCCATAACG AGCTGGAGCT TTAAGTCCGC GCCCGCTCCG GCCGCTGTCT TGAAATTGGC	297
15	GCCCATCCCC GCTCAATAAA TGATAATCCT AATGTGGTCC ACCGCTGCTT CCTCCGCCCT	357
	GTTGGGCGTG ATGTTGAGCG CTGGTATACT GCTCCCACTC GCGGGCCGGC TGCTAATTGC	417
20	CGGCGTTCCG CGCTGCGCGG GCTTCCCGCT GCTGACCGCA CTTACTGCCT CGACGGGTTT	477
	TCTGGCTGTA ACTTTCCCGC CGAGACTGGC ATCGCCCTCT ACTCCCTTCA TGATATGTCA	537
	CCATCTGATG TCGCCGAGGC CATGTTCCGC CATGGTATGA CGCGGCTCTA TGCCGCCCTC	597
25	CATCTTCCGC CTGAGGTCTT GCTGCCCTCT GGCACATATC GCACCGCATC GTATTTGCTA	657
	ATTCATGACG GTAGGCGCGT TGTGGTGACG TATGAGGGTG ATACTAGTGC TGTTTACAAC	717
30	CACGATGTCT CCAACTTGCG CTCCTGGATT AGAACCACCA AGGTTACCGG AGACCATCCC	777
	CTCGTTATCG AGCGGGTTAG GGCCATTGGC TGCCACTTG TTCTCTTGCT CACGGCAGCC	837
	CCGGAGCCAT CACCTATGCC TTATGTTCTT TACCCCGGT CTACCGAGGT CTATGTCCGA	897
35	TCGATCTTCG GCCCGGGTGG CACCCCTTCC TTATTCCAA CCTCATGCTC CACTAAGTCG	957
	ACCTTCCATG CTGTCCCTGC CCATATTTGG GACCGTCTTA TGCTGTTCCG GGCCACCTTG	1017
40	GATGACCAAG CCTTTTGCTG CTCCCGTTTA ATGACCTACC TTCGCGGCAT TAGCTACAAG	1077
	GTCACGTGTT GTACCCCTTG GGCTAATGAA GGCTGGAATG CCTCTGAGGA CGCCCTCACA	1137
	GCTGTTATCA CTGCCGCCTA CCTTACCATT TGCCACCAGC GGTATCTCCG CACCCAGGCT	1197
45	ATATCCAAGG GGATGCGTCG TCTGGAACGG GAGCATGCCC AGAAGTTTAT AACACGCCTC	1257
	TACAGCTGGC TCTTCGAGAA GTCCGGCCGT GATTACATCC CTGGCCGTCA GTTGGAGTTC	1317
50	TACGCCCAGT GCAGGCGCTG GCTCTCCGCC GGCTTTCATC TTGATCCACG GGTGTTGGTT	1377
	TTTGACGAGT CGGCCCTCTG CCATTGTAGG ACCGCGATCC GTAAGGCGCT CTCAAAGTTT	1437
	TGCTGCTTCA TGAAGTGGCT TGGTCAGGAG TGCACCTGCT TCCTTCAGCC TGCAGAAGGC	1497
55	GCCGTCGGCG ACCAGGGTCA TGATAATGAA GCCTATGAGG GGTCCGATGT TGACCCTGCT	1557

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	GAGTCCGCCA TTAGTGACAT ATCTGGGTCC TATGTCGTCC CTGGCACTGC CCTCCAACCG	1617
	CTCTACCAGG CCCTCGATCT CCCCCTGAG ATTGTGGCTC GCGCGGGCCG GCTGACCGCC	1677
5	ACAGTAAAGG TCTCCCAGGT CGATGGGCGG ATCGATTGCG AGACCCTTCT TGGAACAAA	1737
	ACCTTTCGCA CGTCGTTCTG TGACGGGGCG GTCTTAGAGA CCAATGGCCC AGAGCGCCAC	1797
10	AATCTCTCCT TCGATGCCAG TCAGAGCACT ATGGCCGCTG GCCCTTTCAG TCTCACCTAT	1857
	GCCGCCTCTG CAGCTGGGCT GGAGGTGCGC TATGTTGCTG CCGGGCTTGA CCATCGGGCG	1917
	GTTTTTGCCC CCGGTGTTTC ACCCCGGTCA GCGCCGCGG AGGTTACCGC CTTCTGCTCT	1977
15	GCCCTATACA GGTTTAACCG TGAGGCCAG CGCCATTCGC TGATCGGTAA CTTATGGTTC	2037
	CATCCTGAGG GACTCATTGG CCTCTTCGCC CCGTTTTCGC CCGGGCATGT TTGGGAGTCG	2097
20	GCTAATCCAT TCTGTGGCGA GAGCACACT TACACCGTA CTTGGTCGGA GGTGATGCC	2157
	GTCTCTAGTC CAGCCCGGCC TGACTTAGGT TTTATGTCTG AGCCTTCTAT ACCTAGTAGG	2217
	GCCGCCACGC CTACCCTGGC GGCCCTCTA CCCCCCCTG CACCGGACCC TTCCCCCCT	2277
25	CCCTCTGCCC CGGCGCTTGC TGAGCCGGCT TCTGGCGCTA CCGCCGGGGC CCCGGCCATA	2337
	ACTCACCAGA CGGCCCGGCA CCGCCGCTG CTCTTCACCT ACCCGGATGG CTCTAAGGTA	2397
30	TTGCGCGGCT CGCTGTTTGA GTCGACATGC ACGTGGCTCG TTAACGCGTC TAATGTTGAC	2457
	CACCGCCCTG GCGGCGGGCT TTGCCATGCA TTTTACCAA GGTACCCCGC CTCCTTTGAT	2517
	GCTGCCTCTT TTGTGATGCG CGACGGCGCG GCCGCGTACA CACTAACCCC CCGGCCAATA	2577
35	ATTCACGCTG TCGCCCTGA TTATAGGTTG GAACATAACC CAAAGAGGCT TGAGGCTGCT	2637
	TATCGGAAA CTTGCTCCCG CCTCGGCACC GCTGCATACC CGCTCCTCGG GACCGGCATA	2697
40	TACCAGGTGC CGATCGGCCC CAGTTTTGAC GCCTGGGAGC GGAACCACCG CCCCGGGGAT	2757
	GAGTTGTACC TTCCTGAGCT TGCTGCCAGA TGGTTTGAGG CCAATAGGCC GACCCGCCCC	2817
	ACTCTCACTA TAACTGAGGA TGTTCACGG ACAGCGAATC TGCCATCGA GCTTGACTCA	2877
45	GCCACAGATG TCGGCCGGGC CTGTGCCGGC TGTCGGGTCA CCCCCGGCGT TGTTCACTAC	2937
	CAGTTTACTG CAGGTGTGCC TGGATCCGGC AAGTCCCGCT CTATCACCCA AGCCGATGTG	2997
50	GACGTTGTCG TGGTCCCGAC GCGTGAGTTG CGTAATGCCT GGCGCCGTCG CGGCTTTGCT	3057
	GCTTTTACCC CGCATACTGC CGCCAGAGTC ACCCAGGGGC GCCGGGTTGT CATTGATGAG	3117
	GCTCCATCCC TCCCCCTCA CCTGCTGCTG CTCCACATGC AGCGGGCCGC CACCGTCCAC	3177
55	CTTCTTGGCG ACCCGAACCA GATCCCAGCC ATCGACTTTG AGCACGCTGG GCTCGTCCCC	3237

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	GCCATCAGGC CCGACTTAGG CCCACCTCC TGGTGGCATG TTACCCATCG CTGGCCTGCG	3297
	GATGTATGCG AGCTCATCCG TGGTGCATAC CCCATGATCC AGACCACTAG CCGGGTTCTC	3357
5	CGTTCGTTGT TCTGGGGTGA GCCTGCCGTC GGGCAGAAAC TAGTGTTTAC CCAGGCGGCC	3417
	AAGCCCGCCA ACCCCGGCTC AGTGACGGTC CACGAGGCGC AGGGCGCTAC CTACACGGAG	3477
10	ACCACTATTA TTGCCACAGC AGATGCCCGG GGCCTTATTC AGTCGTCTCG GGCTCATGCC	3537
	ATTGTTGCTC TGACGCGCCA CACTGAGAAG TGCGTCATCA TTGACGCACC AGGCGTCTT	3597
	CGCGAGGTGG GCATCTCCGA TGCAATCGTT AATAACTTTT TCCTCGCTGG TGGCGAAATT	3657
15	GGTCACCAGC GCCCATCAGT TATCCCCGT GGCAACCCTG ACGCCAATGT TGACACCCTG	3717
	GCTGCCTTCC CGCCGTCTTG CCAGATTAGT GCCTTCCATC AGTTGGCTGA GGAGCTTGGC	3777
20	CACAGACCTG TCCCTGTTGC AGCTGTTCTA CCACCCTGCC CCGAGCTCGA ACAGGGCCTT	3837
	CTCTACCTGC CCCAGGAGCT CACCACCTGT GATAGTGTG TAACATTTGA ATTAACAGAC	3897
	ATTGTGCACT GCCGCATGGC CGCCCCGAGC CAGCGCAAGG CCGTGCTGTC CACACTCGTG	3957
25	GGCCGCTACG GCGGTGCGAC AAAGCTCTAC AATGCTTCCC ACTCTGATGT TCGCGACTCT	4017
	CTCGCCCGTT TTATCCCGGC CATTGGCCCC GTACAGGTTA CAACTTGTGA ATTGTACGAG	4077
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35	TGCGCCCTCT TTGGCCCTTG GTTCCGCGCT ATTGAGAAGG CTATTCTGGC CCTGCTCCCT	4317
	CAGGGTGTGT TTTACGGTGA TGCCTTTGAT GACACCGTCT TCTCGGCGGC TGTGGCCGCA	4377
40	GCAAAGGCAT CCATGGTGTT TGAGAATGAC TTTTCTGAGT TTGACTCCAC CCAGAATAAC	4437
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	CGCCTGTATC ACCTATAAG GTCTGCGTGG ATCTTGCAAG CCCCAGGA GTCTCTGCGA	4557
45	GGGTTTTGGA AGAAACACTC CGGTGAGCCC GGCACCTTTC TATGGAATAC TGTCTGGAAT	4617
	ATGGCCGTTA TTACCCACTG TTATGACTTC CGCGATTTTC AGGTGGCTGC CTTTAAAGGT	4677
50	GATGATTCTA TAGTGCTTTG CAGTGAGTAT CGTCAGAGTC CAGGAGCTGC TGTCTGATC	4737
	GCCGGCTGTG GCTTGAAGTT GAAGGTAGAT TTCCGCCGCA TCGGTTTGTG TGCAAGGTGT	4797
	GTGGTGGCCC CCGGCCCTGG CGCGTCCCT GATGTTGTGC GCTTCGCCGG CCGGCTTACC	4857
55	GAGAAGAATT GGGGCCCTGG CCCTGAGCGG GCGGAGCAGC TCCGCCTCGC TGTTAGTGAT	4917

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	TTCCTCCGCA AGCTCACGAA TGAGCTCAG ATGTGTGTGG ATGTTGTTTC CCGTGTTTAT	4977
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5	AAGGCACATT TCACTGAGTC AGTAAACCA GTGCTCGACT TGACAAATTC AATCTTGTGT	5097
	CGGGTGGAAT GA ATAACATGTC TTTTGCTGCG CCCATGGGTT CGCGACCATG	5149
10	CGCCCTCGGC CTATTTTGT GCTGCTCCTC ATGTTTTTGC CTATGCTGCC CGCGCCACCG	5209
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	CCACTCGGCT CCGCTTGCG TGACCAGGCC CAGCGCCCCG CCGTTGCCTC ACGTCGTAGA	5449
20	CCTACCACAG CTGGGGCCGC GCCGCTAA CCGCGGTCGC TCCGGCCCAT GACACCCCGC	5507
	CAGTGCCTGA TGTCGACTCC CGCGGCGCCA TCTTGCGCCG GCAGTATAAC CTATCAACAT	5567
	CTCCCCTTAC CTCTTCCGTG GCCACCGGCA CTAACCTGGT TCTTTATGCC GCCCCTCTTA	5627
25	GTCCGCTTTT ACCCCTTCAG GACGGCACCA ATACCCATAT AATGGCCACG GAAGCTTCTA	5687
	ATTATGCCCA GTACCGGGTT GCCCGTGCCA CAATCCGTTA CCGCCCGCTG GTCCCAATG	5747
30	CTGTGCGCGG TTACGCCATC TCCATCTCAT TCTGGCCACA GACCACCACC ACCCCGACGT	5807
	CCGTTGATAT GAATTCAATA ACCTCGACGG ATGTTGCTAT TTTAGTCCAG CCCGGCATAG	5867
	CCTCTGAGCT TGTGATCCCA AGTGAGCGCC TACACTATCG TAACCAAGGC TGGCGCTCCG	5927
35	TCGAGACCTC TGGGGTGGCT GAGGAGGAGG CTACCTCTGG TCTTGTTATG CTTTGCATAC	5987
	ATGGCTCACT CGTAAATTCC TATACTAATA CACCCTATAC CGGTGCCCTC GGGCTGTTGG	6047
40	ACTTTGCCCT TGAGCTTGAG TTTGCAACC TTACCCCGG TAACACCAAT ACGCGGGTCT	6107
	CCCGTTATTC CAGCACTGCT CGCCACCGCC TTCGTCGCGG TCGGACGGG ACTGCCGAGC	6167
	TCACCACCAC GGCTGCTACC CGCTTTATGA AGGACCTCTA TTTTACTAGT ACTAATGGTG	6227
45	TCGGTGAGAT CGGCCGCGGG ATAGCCCTCA CCCTGTTCAA CCTTGCTGAC ACTCTGCTTG	6287
	GCGGCCTGCC GACAGAATTG ATTTGCTCGG CTGGTGGCCA GCTGTTCTAC TCCCGTCCCG	6347
50	TTGTCTCAGC CAATGGCGAG CCGACTGTGA AGTTGTATAC ATCTGTAGAG AATGCTCAGC	6407
	AGGATAAGGG TATTGCAATC CCGCATGACA TTGACCTCGG AGAATCTCGT GTGGTTATTC	6467
	AGGATTATGA TAACCAACAT GAACAAGATC GGCCGACGCC TTCTCCAGCC CCATCGCGCC	6527
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	ACCAGTCCAC TTATGGCTCT TCGACTGGCC CAGTTTATGT TTCTGACTCT GTGACCTTGG	6647
	TTAATGTTGC GACCGGCGCG CAGGCCGTTG CCCGGTCGCT CGATTGGACC AAGGTCACAC	6707
5	TTGACGGTCG CCCCTCTCC ACCATCCAGC AGTACTCGAA GACCTTCTTT GTCCTGCCGC	6767
	TCCGCGGTAA GCTCTCTTTC TGGGAGGCAG GCACAATAA AGCCGGGTAC CTTATAATT	6827
10	ATAACACCAC TGCTAGCGAC CAACTGCTTG TCGAGAATGC CGCCGGGCAC CGGGTCGCTA	6887
	TTTCCACTTA CACCACTAGC CTGGGTGCTG GTCCCGTCTC CATTTCTGCG GTTGCCGTTT	6947
	TAGCCCCCA CTCTGCGCTA GCATTGCTTG AGGATACCTT GGACTACCCT GCCCGCGCCC	7007
15	ATACTTTTGA TGATTTCTGC CCAGAGTGCC GCCCCCTTGG CCTTCAGGGC TGCCTTTCC	7067
	AGTCTACTGT CGCTGAGCTT CAGCGCCTTA AGATGAAGGT GGGTAAACT CGGGAGTTGT	7127
20	AG TTTATTTGCT TGTGCCCCC TTCTTTCTGT TGCTTATTC TCATTTCTGC	7179
	GTTCCGCGCT CCCTGA	7195
	a fourth sequence (SEQ ID NO.10):	
25	GCCATGGAGG CCCACCAGTT CATTAAGGCT CCTGGCATCA CTACTGCTAT TGAGCAAGCA	60
	GCTCTAGCAG CGGCCAACTC CGCCCTTGCG AATGCTGTGG TGGTCCGGCC TTTCTTTCC	120
	CATCAGCAGG TTGAGATCCT TATAAATCTC ATGCAACCTC GGCAGCTGGT GTTTCGTCCT	180
30	GAGGTTTTTT GGAATCACCC GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC	240
	CGTGCTCGCT CGGGTCGCTG CCTTGAGATT GGAGCCCACC CACGCTCCAT TAATGATAAT	300
35	CCTAATGTCC TCCATCGCTG CTTTCTCCAC CCCGTCGGCC GGGATGTTCA GCGCTGGTAC	360
	ACAGCCCCGA CTAGGGGACC TCGGGCGAAC TGTCGCCGCT CGGCACTTCG TGGTCTGCCA	420
40	CCAGCCGACC GCACTTACTG TTTTGATGGC TTTGCCGGCT GCCGTTTTGC CGCCGAGACT	480
	GGTGTGGCTC TCTATTCTCT CCATGACTTG CAGCCGGCTG ATGTTGCCGA GGCGATGGCT	540
	CGCCACGGCA TGACCCGCCT TTATGCAGCT TTCCACTTGC CTCCAGAGGT GCTCCTGCCT	600
45	CCTGGCACCT ACCGGACATC ATCCTACTTG CTGATCCACG ATGGTAAGCG CGCGGTTGTC	660
	ACTTATGAGG GTGACACTAG CGCCGGTTAC AATCATGATG TTGCCACCCT CCGCACATGG	720
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50	GGCTGTCACT TTGTGTTGTT GATCACTGCG GCCCCTGAGC CCTCCCCGAT GCCCTACGTT	840
	CCTTACCCGC GTTCGACGGA GGTCTATGTC CGGTCTATCT TTGGGCCCGG CGGGTCCCCG	900
55	TCGCTGTTCC CGACCGCTTG TGCTGTCAAG TCCACTTTTC ACGCCGTCCC CACGCACATC	960

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5 TGGGACCGTC TCATGCTCTT TGGGGCCACC CTCGACGACC AGGCCTTTTG CTGCTCCAGG 1020  
CTTATGACGT ACCTTCGTGG CATTAGCTAT AAGGTAAC TG GGTGCGCTT GGTCGCTAAT 1080  
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15 GAGTGTCTT GTTTCCTCCA GCCCGCCGAG GGGCTGGCGG GCGACCAAGG TCATGACAAT 1500  
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20 TCATACATCG TGGATGGTCG GTCTCTGCAA ACTGTCTATC AAGCTCTCGA CCTGCCAGCT 1620  
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35 CCGCCCTTTT CACCCGGGCA TGAGTGGCGG TCTGCTAACC CATTTTGCGG CGAGAGCAGC 2100  
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40 GGTCAATTGG ATGCTGCTCC CCACTCGGGG GGGCCACCTG CTAAGTCCAC AGGCCCTGCT 2220  
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45 CCCTCTGGGG CCCGTCCGGC TGGCCCCAAC CCGAATGGCG TTCCGCAGCG CCGCTTACTA 2340  
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50 TTTGAGCGTT ACCCTGATTC GTTTGACGCC ACCAAGTTTG TGATGCGTGA TGGTCTTGCC 2520  
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55 CATAACCCCA AGAGGCTCGA GGCTGCCTAC CGCGAGACTT GCGCCCGCCG AGGCACTGCT 2640



GCCTATCCAC TCTTAGGCGC TGGCATTAC CAGGTGCCTG TTAGTTGAG TTTTGATGCC 2700  
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5 TTTGAATCCA ACCGCCCCGG TCAGCCCACG TTGAACATAA CTGAGGATAC CGCCCGTGCG 2820  
GCCAACCTGG CCCTGGAGCT TGAATCCGGG AGTGAAGTAG GCCGCGCATG TGCCGGGTGT 2880  
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15 AGCGGCCGTA GGGTTGTCAT TGATGAGGCC CCTTCGCTCC CCCCACACTT GCTGCTTTTA 3120  
CATATGCAGC GTGCTGCATC TGTGCACCTC CTTGGGGACC CGAATCAGAT CCCCGCCATA 3180  
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AAAATCCAGA CTACAAGTAA GGTGCTCCGT TCCCTTTTCT GGGGAGAGCC AGCTGTGCGC 3360  
25 CAGAAGCTAG TGTTACACACA GGCTGCTAAG GCCGCGCACC CCGGATCTAT AACGGTCCAT 3420  
GAGGCCCAGG GTGCCACTTT TACCACTACA ACTATAATTG CAACTGCAGA TGCCCGTGCG 3480  
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35 AACCTGACC GCAATGTTGA CGTGCTTGGC GCGTTTCCAC CTTTATGCCA AATAAGCGCC 3720  
TTCCATCAGC TTGCTGAGGA GCTGGGCCAC CGGCCGGCGC CGGTGGCGGC TGTGCTACCT 3780  
CCCTGCCCTG AGCTTGAGCA GGGCCTTCTC TATCTGCCAC AGGAGCTAGC CTCCTGTGAC 3840  
40 AGTGTGTGTA CATTTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA 3900  
AGGAAAGCTG TTTTGTCCAC GCTGGTAGGC CGGTATGGCA GACGCACAAG GCTTTATGAT 3960  
45 GCGGGTCACA CCGATGTCCG CGCCTCCCTT GCGCGCTTTA TTCCACTCT CGGGCGGGTT 4020  
ACTGCCACCA CCTGTGAACT CTTTGAGCTT GTAGAGGCGA TGGTGGAGAA GGGCCAAGAC 4080  
GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCCGCAT AACCTTTTTC 4140  
50 CAGAAGGATT GTAACAAGTT CACGACCGGC GAGACAATTG CGCATGGCAA AGTCGGTCAG 4200  
GGTATCTTCC GCTGGAGTAA GACGTTTTGT GCCCTGTTT GCCCCTGGTT CCGTGCGATT 4260  
55 GAGAAGGCTA TTCTATCCCT TTTACCACAA GCTGTGTTCT ACGGGGATGC TTATGACGAC 4320

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	TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTGTTGA AAATGATTTT	4380
	TCTGAGTTTG ACTCGACTCA GAATAACTTT TCCCTAGGTC TTGAGTGCGC CATTATGGAA	4440
5	GAGTGTGGTA TGCCCCAGTG GCTTGTGAGG TTGTACCATG CCGTCCGGTC GGCGTGGATC	4500
	CTGCAGGCCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC	4560
	AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG	4620
10	GACCTCCAGG TTGCCGCCTT CAAGGGCGAC GACTCGGTG TCCTCTGTAG TGAATACCGC	4680
	CAGAGCCCAG GCGCCGGTTC GCTTATAGCA GGCTGTGGTT TGAAGTTGAA GGCTGACTTC	4740
15	CGGCCGATTG GGCTGTATGC CGGGGTTGTC GTCGCCCCGG GGCTCGGGGC CCTACCCGAT	4800
	GTGTTTCGAT TCGCCGGACG GCTTTCGGAG AAGAACTGGG GGCCTGATCC GGAGCGGGCA	4860
	GAGCAGCTCC GCCTCGCCGT GCAGGATTTC CTCCGTAGGT TAACGAATGT GGCCCAGATT	4920
20	TGTGTTGAGG TGGTGTCTAG AGTTTACGGG GTTTCCCCGG GTCTGTTCA TAACCTGATA	4980
	GGCATGCTCC AGACTATTGG TGATGGTAAG GCGCATTTTA CAGAGTCTGT TAAGCCTATA	5040
25	CTTGACCTTA CAACTCAAT TATGCACCGG TCTGAATGAA TAACATGTGG TTTGCTGCGC	5100
	CCATGGGTTT GCCACCATGC GCCCTAGGCC TCTTTTGCTG TTGTTCTCT TGTTCCTGCC	5160
30	TATGTTGCCC GCGCCACCGA CCGGTCAGCC GTCTGGCCGC CGTCGTGGGC GGCGCAGCGG	5220
	CGGTACCGGC GGTGGTTTCT GGGGTGACCG GGTGATTCT CAGCCCTTCG CAATCCCCTA	5280
	TATTCATCCA ACCAACCCCT TTGCCCCAGA CGTTGCCGT GCGTCCGGGT CTGGACCTCG	5340
35	CCTTCGCCAA CCAGCCCGGC CACTTGCTC CACTTGCGA GATCAGGCC AGCGCCCTC	5400
	CGCTGCCTCC CGTCGCCGAC CTGCCACAGC CGGGGCTGCG GCGCTGACGG CTGTGGCGCC	5460
40	TGCCCATGAC ACCTCACCCG TCCCGGACGT TGATTCTCGC GGTGCAATTC TACGCCGCCA	5520
	GTATAATTTG TCTACTTCAC CCCTGACATC CTCTGTGGCC TCTGGCACTA ATTTAGTCTT	5580
	GTATGCAGCC CCCCTTAATC CGCCTCTGCC GCTGCAGGAC GGTACTAATA CTCACATTAT	5640
45	GGCCACAGAG GCCTCCAATT ATGCACAGTA CCGGGTTGCC GCGCTACTA TCCGTTACCG	5700
	GCCCCTAGTG CCTAATGCAG TTGGAGGCTA TGCTATATCC ATTTCTTTCT GGCCTCAAAC	5760
50	AACCACAACC CCTACATCTG TTGACATGAA TTCCATTACT TCCACTGATG TCAGGATTCT	5820
	TGTTCAACCT GGCATAGCAT CTGAATTGGT CATCCCAAGC GAGCGCCTTC ACTACCGCAA	5880
	TCAAGGTTGG CGCTCGGTTG AGACATCTGG TGTTGCTGAG GAGGAAGCCA CCTCCGGTCT	5940
55	TGTCATGTTA TGCATACATG GCTCTCCAGT TAACTCCTAT ACCAATACCC CTTATACCGG	6000

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	TGCCCTTGGC TTACTGGACT TTGCCTTAGA GCTTGAGTTT CGCAATCTCA CCACCTGTAA	6060
	CACCAATACA CGTGTGTCCC GTTACTCCAG CACTGCTCGT CACTCCGCCC GAGGGGCCGA	6120
5	CGGGACTGCG GAGCTGACCA CAACTGCAGC CACCAGGTTT ATGAAAGATC TCCACTTTAC	6180
	CGGCCCTTAAT GGGGTAGGTG AAGTCGGCCG CGGGATAGCT CTAACATTAC TTAACCTTGC	6240
	TGACACGCTC CTCGGCGGGC TCCCGACAGA ATTAATTTCTG TCGGCTGGCG GGCAACTGTT	6300
10	TTATTCCTCGC CCGGTTGTCT CAGCCAATGG CGAGCCAACC GTGAAGCTCT ATACATCAGT	6360
	GGAGAATGCT CAGCAGGATA AGGGTGTTC TATCCCCAC GATATCGATC TTGGTGATTC	6420
15	GCGTGTGGTC ATTCAGGATT ATGACAACCA GCATGAGCAG GATCGGCCCA CCCCGTCGCC	6480
	TGCGCCATCT CGGCCTTTTT CTGTTCTCG AGCAAATGAT GTACTTTGGC TGTCCCTCAC	6540
	TGCAGCCGAG TATGACCAGT CCACTTACGG GTCGTCAACT GGCCCGGTTT ATATCTCGGA	6600
20	CAGCGTGACT TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG	6660
	GTCCAAAGTC ACCCTCGAGC GCGGCCCTT CCCGACTGTT GAGCAATATT CCAAGACATT	6720
25	CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTGGGAG GCCGGCACAA CAAAGCAGG	6780
	TTATCCTTAT AATTATAATA CTAAGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG	6840
	CCATCGGGTC GCCATTTCAA CCTATACCAC CAGGCTTGGG GCCGGTCCGG TCGCCATTTT	6900
30	TGCGGCCGCG GTTTTGGCTC CACGCTCCGC CCTGGCTCTG CTGGAGGATA CTTTGTATTA	6960
	TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCCTCCA	7020
35	GGGTTGTGCT TTCCAGTCAA CTGTCGCTGA GCTCCAGCGC CTAAAGTTA AGGTGGGTAA	7080
	AACTCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTTCTTTT	7140
40	ATTCCTTTT TCTCGGTCCC GCGCTCCCTG A	7171

or a fifth sequence (SEQ ID NO.12):

	CGGGCCCCGT ACAGGTCACA ACCTGTGAGT TGTACGAGCT AGTGGAGGCC ATGGTCGAGA	60
	AAGGCCAGGA TGGCTCCGCC GTCCTTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA	120
45	TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATC GCCCATGGTA	180
	AAGTGGGCCA GGGCATTTCG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCTGGT	240
50	TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG	300
	CCTTTGATGA CACCGTCTTC TCGGCGCGTG TGGCCGAGC AAAGGCGTCC ATGGTGTGTTG	360
	AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCCTGGGC CTAGAGTGTG	420
55	CTATTATGGA GAAGTGTGGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT	480

5 CTGCGTGGAT CCTGCAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG 540  
 GTGAGCCCGG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTTATC ACCCATTGTT 600  
 ACGATTTCG CGATTTCAG GTGGCTGCCT TTAAAGGTGA TGATTGATA GTGCTTTGCA 660  
 GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAAGCTGA 720  
 10 AGGTGGGTTT CCGTCCGATT GGTTGTATG CAGGTGTTGT GGTGACCCCC GGCCCTTGCG 780  
 CGCTTCCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCCTGGCC 840  
 CTGAGCGGGC GGAGCAGCTC CGCCTTGCTG TGCG 874

15 or a sequence complementary thereto.

20 4. A protein which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) derived from a viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZXF1(ET1.1) carried in E. coli strain BB4, and having ATCC  
 25 Deposit Nno. 67717.

5. The protein of claim 4, which is encoded by a coding region within said 1.33 kb EcoRI insert.

30 6. A protein which is (a) immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) encoded by genetic sequence 406.3-2 or 406.4-2 or a fragment thereof.

35 7. A method of detecting infection by enterically transmitted nonA/nonB hepatitis viral agent in a test individual, comprising:  
 providing a peptide antigen which is (a)  
 40 immunoreactive with antibodies present in individuals infected with enterically transmitted nonA/nonB hepatitis and (b) derived from a viral hepatitis agent whose genome contains a region which is homologous to

the 1.33 kb DNA EcoRI insert present in plasmid  
pTZKF1(ET1.1) carried in E. coli strain BB4, and  
having ATCC deposit no. 67717,

5        reacting serum from the test individual with  
such antigen, and  
      examining the antigen for the presence of  
bound antibody.

8.     The method of claim 7, wherein the serum  
10    antibody is an IgM or IgG antibody, or a mixture of  
both, the antigen provided is attached to a support,  
said reacting includes contacting such serum with the  
support and said examining includes reacting the  
support and bound serum antibody with a reporter-  
15    labeled anti-human antibody.

9.     A kit for ascertaining the presence of serum  
antibodies which are diagnostic of enterically  
transmitted nonA/nonB hepatitis infection, comprising  
20        a support with surface-bound recombinant  
peptide antigen which is (a) immunoreactive with  
antibodies present in individuals infected with  
enterically transmitted nonA/nonB viral hepatitis  
agent and (b) derived from a viral hepatitis agent  
25    whose genome contains a region which is homologous to  
the 1.33 kb DNA EcoRI insert present in plasmid  
pTZKF1(ET1.1) carried in E. coli strain BB4, and  
having ATCC deposit no. 67717, and  
      a reporter-labeled anti-human antibody.

30  
10.    A DNA fragment derived from an enterically  
transmitted nonA/nonB viral hepatitis agent whose  
genome contains a region which is homologous to the  
1.33 kb DNA EcoRI insert present in plasmid  
35    pTZKF1(ET1.1) carried in E. coli strain BB4 and having  
ATCC deposit no. 67717.

11. The fragment of claim 10, which is derived from said 1.33 kb EcoRI insert.

12. A DNA molecule comprising genetic sequence 406.3-2 or 406.4-2 or a fragment thereof, wherein said fragment comprises at least 12 consecutive nucleotides.

13. A DNA fragment derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to a DNA fragment within a first sequence (SEQ ID NO.1):

AGACCTGTCC CTGTTGCAGC TGTTCTACCA CCCTGCCCG AGCTCGAACA GGGCCTTCTC 60  
TACCTGCCCC AGGAGCTCAC CACCTGTGAT AGTGTCTGTA CATTGAATT AACAGACATT 120  
GTGCACTGCC GCATGGCCGC CCCGAGCCAG CGCAAGGCCG TGCTGTCCAC ACTCGTGGGC 180  
CGCTACGGCG GTCGCACAAA GCTCTACAAT GCTTCCCACT CTGATGTTTC GACTCTCTC 240  
GCCCGTTTTA TCCCGGCCAT TGGCCCCGTA CAGGTTACAA CTTGTGAATT GTACGAGCTA 300  
GTGGAGGCCA TGGTCGAGAA GGGCCAGGAT GGCTCCGCCG TCCTTGAGCT TGATCTTTGC 360  
AACCGTGACG TGTCAGGAT CACCTTCTTC CAGAAAGATT GTAACAAGTT CACCACAGGT 420  
GAGACCATTG CCCATGGTAA AGTGGGCCAG GGCATCTCGG CCTGGAGCAA GACCTTCTGC 480  
GCCCTCTTTG GCCCTTGTTT CCGCGCTATT GAGAAGGCTA TTCTGGCCCT GCTCCCTCAG 540  
GGTGTGTTTT ACGGTGATGC CTTTGATGAC ACCGTCTTCT CGGCGGCTGT GGCCGCAGCA 600  
AAGGCATCCA TGGTGTGTTA GAATGACTTT TCTGAGTTT ACTCCACCCA GAATAACTTT 660  
TCTCTGGGTC TAGAGTGTGC TATTATGGAG GAGTGTGGGA TGCCGCAGTG GCTCATCCGC 720  
CTGTATCACC TTATAAGGTC TCGTGGATC TTGCAGGCCG CGAAGGAGTC TCTGCGAGGG 780  
TTTTGGAAGA AACACTCCGG TGAGCCCGGC ACTCTTCTAT GGAATACTGT CTGGAATATG 840  
GCCGTATTA CCCACTGTTA TGACTTCCGC GATTTTCAGG TGGCTGCCTT TAAAGGTGAT 900  
GATTCGATAG TGCTTTGCAG TGAGTATCGT CAGAGTCCAG GAGCTGCTGT CCTGATCGCC 960  
GGCTGTGGCT TGAAGTTGAA GGTAGATTTC CGCCGATCG GTTTGTATGC AGGTGTTGTG 1020  
GTGGCCCCCG GCCTTGGCGC GCTCCCTGAT GTTGTGCGCT TCGCCGGCCG GCTTACCGAG 1080  
AAGAATTGGG GCCCTGGCCC TGAGCGGGCG GAGCAGCTCC GCCTCGCTGT TAGTGATTTT 1140

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CTCCGCAAGC TCACGAATGT AGCTCAGATG TGTGTGGATG TTGTTTCCCG TGTATATGGG 1200  
 GTTTCCTG GACTCGTTCA TAACCTGATT GGCATGCTAC AGGCTGTTGC TGATGGCAAG 1260  
 5 GCACATTTC CTGAGTCAGT AAAACCCAGT CCGA 1295

a second sequence (SEQ ID NO.5):

TCGAGCACTG GTTTACTGA CTCAGTGAAA TGTGCCTTGC CATCAGCAAC AGCCTGTAGC 60  
 10 ATGCCAATCA GGTATGAAC GAGTCCAGGG GAAACCCCAT AAACACGGGA AACAACATCC 120  
 ACACACATCT GAGCTACATT CGTGAGCTTG CGGAGGAAAT CACTAACAGC GAGGCGGAGC 180  
 TGCTCCGCCC GCTCAGGGCC AGGGCCCCAA TTCTTCTCGG TAAGCCGGCC GGCGAAGCGC 240  
 15 ACAACATCAG GGAGCGCGCC AAGGCCGGGG GCCACCACAA CACCTGCATA CAAACCGATC 300  
 GGGCGGAAAT CTACCTTCAA CTTCAAGCCA CAGCCGGCGA TCAGGACAGC AGCTCCTGGA 360  
 20 CTCTGACGAT ACTACTGCA AAGCACTATC GAATCATCAC CTTTAAAGGC AGCCACCTGA 420  
 AAATCGCGGA AGTCATAACA GTGGGTAATA ACGGCCATAT TCCAGACAGT ATTCCATAGA 480  
 AGAGTGCCGG GCTCACCAGA GTGTTTCTTC CAAAACCCTC GCAGAGACTC CTTGCGGGCC 540  
 25 TGCAAGATCC ACGCAGACCT TATAAGGTGA TACAGGCGGA TGAGCCACTG CGGCATCCCA 600  
 CACTCTCCA TAATAGCACA CTCTAGACCC AGAGAAAAGT TATTCTGGGT GGAGTCAAAC 660  
 30 TCAGAAAAGT CATTCTCAA CACCATGGAT GCCTTTGCTG CGGCCACAGC CGCCGAGAAG 720  
 ACGGTGTCAT CAAAGGCATC ACCGTAAAC ACACCCTGAG GGAGCAGGGC CAGAATAGCC 780  
 TTCTCAATAG CGCGGAACCA AGGGCCAAAG AGGGCGCAGA AGGTCTTGCT CCAGGCCGAG 840  
 35 ATGCCCTGGC CCACTTTACC ATGGGCAATG GTCTCACCTG TGGTGAACCT GTTACAATCT 900  
 TTCTGGAAGA AGGTGATCCT GGACACGTCA CGTTTGCAA GATCAAGCTC AAGGACGGCG 960  
 40 GAGCCATCCT GGCCCTTCTC GACCATGGCC TCCACTAGCT CGTACAATC ACAAGTTGTA 1020  
 ACCTGTACGG GGCCAATGGC CGGGATAAAA CGGGCGAGAG AGTCGCGAAC ATCAGAGTGG 1080  
 GAAGCATTGT AGAGCTTTGT GCGACCGCCG TAGCGGCCCA CGAGTGTGGA CAGCACGGCC 1140  
 45 TTGCGCTGGC TCGGGGCGGC CATGCGGCAG TGCACAATGT CTGTTAATC AAATGTTACG 1200  
 AACTATCAC AGGTGGTGAG CTCCTGGGGC AGGTAGAGAA GGCCCTGTT CAGCTCGGGG 1260  
 50 CAGGGTGGTA GAACAGCTGC AACAGGGACA GGTCT 1295

a third sequence (SEQ ID NO.6):

AGGCAGACCA CATATGTGGT CGATGCC ATGGAGGCC ATCAGTTTAT TAAGGCTCCT 57  
 55 GGCATCACTA CTGCTATTGA GCAGGCTGCT CTAGCAGCG CCAACTCTGC CCTGGCGAAT 117

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	GCTGTGGTAG TTAGGCCTTT TCTCTCTCAC CAGCAGATTG AGATCCTCAT TAACCTAATG	177
	CAACCTCGCC AGCTTGTTTT CCGCCCCGAG GTTTTCTGGA ATCATCCCAT CCAGCGTGTC	237
5	ATCCATAACG AGCTGGAGCT TTAGTGCCGC GCCCGCTCCG GCCGCTGTCT TGAAATTGGC	297
	GCCCATCCCC GCTCAATAAA TGATAATCCT AATGTGGTCC ACCGCTGCTT CCTCCGCCCT	357
10	GTTGGGCGTG ATGTTAGCG CTGGTATACT GCTCCCACTC GCGGGCCGGC TGCTAATTGC	417
	CGGCGTTCCG CGCTGCGCGG GCTTCCCGCT GCTGACCGCA CTTACTGCCT CGACGGGTTT	477
	TCTGGCTGTA ACTTTCCCGC CGAGACTGGC ATCGCCCTCT ACTCCCTTCA TGATATGTCA	537
15	CCATCTGATG TCGCCGAGGC CATGTTCCGC CATGGTATGA CGCGGCTCTA TGCCGCCCTC	597
	CATCTTCCGC CTGAGGTCCT GCTGCCCCCT GGCACATATC GCACCGCATC GTATTTGCTA	657
20	ATTCATGACG GTAGGCGCGT TGTGGTGACG TATGAGGGTG AACTAGTGC TGTTACAAC	717
	CACGATGTCT CCAACTTGCG CTCCTGGATT AGAACCACCA AGGTTACCGG AGACCATCCC	777
	CTCGTTATCG AGCGGGTTAG GGCCATTGGC TGCCACTTTG TTCTTTGCT CACGGCAGCC	837
25	CCGGAGCCAT CACCTATGCC TTATGTTCTT TACCCCGGT CTACCGAGGT CTATGTCCGA	897
	TCGATCTTCG GCCCGGGTGG CACCCCTTCC TTATTCCTAA CCTCATGCTC CACTAAGTCG	957
30	ACCTTCCATG CTGTCCCTGC CCATATTTGG GACCGTCTTA TGCTGTTCCG GGCCACCTG	1017
	GATGACCAAG CCTTTTGCTG CTCCCGTTTA ATGACCTACC TTCGCGCAT TAGCTACAAG	1077
	GTCAGTGTG GTACCTTGT GGCTAATGAA GGCTGGAATG CCTCTGAGGA CGCCCTCACA	1137
35	GCTGTTATCA CTGCCGCTA CCTTACCATT TGCCACCAGC GGTATCTCCG CACCCAGGCT	1197
	ATATCCAAGG GGATGCGTCG TCTGGAACGG GAGCATGCCC AGAAGTTTAT AACACGCCTC	1257
40	TACAGCTGGC TCTTCGAGAA GTCCGGCCGT GATTACATCC CTGGCCGTCA GTTGGAGTTC	1317
	TACGCCAGT GCAGGCGCTG GCTCTCCGCC GGCTTTTCATC TTGATCCACG GGTGTTGGTT	1377
	TTTGACGAGT CGGCCCCCTG CCATTGTAGG ACCGCGATCC GTAAGGCGCT CTCAAAGTTT	1437
45	TGCTGCTTCA TGAAGTGGCT TGGTCAGGAG TGCACCTGCT TCCTTCAGCC TGCAGAAGGC	1497
	GCCGTCGGCG ACCAGGGTCA TGATAATGAA GCCTATGAGG GGTCCGATGT TGACCCTGCT	1557
50	GAGTCCGCCA TTAGTGACAT ATCTGGGTCC TATGTCGTCC CTGGCACTGC CCTCCAACCG	1617
	CTCTACCAGG CCCTCGATCT CCCCCTGAG ATTGTGGCTC GCGCGGGCCG GCTGACCGCC	1677
	ACAGTAAAGG TCTCCAGGT CGATGGGCGG ATCGATTGCG AGACCCTTCT TGGTAACAAA	1737
55	ACCTTTCGCA CGTCGTTCTG TGACGGGGCG GTCTTAGAGA CCAATGGCCC AGAGCGCCAC	1797



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	AATCTCTCCT TCGATGCCAG TCAGAGCACT ATGGCCGCTG GCCCTTTCAG TCTCACCTAT	1857
	GCCGCCTCTG CAGCTGGGCT GGAGGTGCGC TATGTTGCTG CCGGGCTTGA CCATCGGGCG	1917
5	GTTTTTGCCC CCGGTGTTTC ACCCCGGTCA GCGCCCGGCG AGGTTACCGC CTTCTGCTCT	1977
	GCCCTATACA GGTTTAACCG TGAGGCCAG CGCCATTGCG TGATCGGTAA CTTATGGTTC	2037
10	CATCCTGAGG GACTCATTGG CCTCTTCGCC CCGTTTTCGC CCGGGCATGT TTGGGAGTCG	2097
	GCTAATCCAT TCTGTGGCGA GAGCACACTT TACACCCGTA CTTGGTCGGA GGTTGATGCC	2157
	GTCTCTAGTC CAGCCCGGCC TGACTTAGGT TTTATGCTG AGCCTTCTAT ACCTAGTAGG	2217
15	GCCGCCACGC CTACCCTGGC GGCCCTCTA CCCCCCCTG CACCGGACCC TTCCCCCCT	2277
	CCCTCTGCCC CGGCGCTTGC TGAGCCGGCT TCTGGCGCTA CCGCCGGGGC CCGGCCATA	2337
20	ACTCACCAGA CGGCCCGGCA CCGCCGCTG CTCTTACCT ACCCGGATGG CTCTAAGGTA	2397
	TTCGCCGGCT CGCTGTTGTA GTCGACATGC ACGTGGCTCG TTAACGCGTC TAATGTTGAC	2457
	CACCGCCCTG GCGGCGGGCT TTGCCATGCA TTTTACCAA GGTACCCCGC CTCCTTTGAT	2517
25	GCTGCCTCTT TTGTGATGCG CGACGGCGCG GCCGCGTACA CACTAACCC CCGGCCAATA	2577
	ATTCACGCTG TCGCCCTGA TTATAGTTG GAACATAACC CAAAGAGGCT TGAGGCTGCT	2637
30	TATCGGGAAA CTTGCTCCCG CCTCGGCACC GCTGCATACC CGCTCCTCGG GACCGGCATA	2697
	TACCAGGTGC CGATCGGCCC CAGTTTTGAC GCCTGGGAGC GGAACCACCG CCGGGGGAT	2757
	GAGTTGTACC TTCCTGAGCT TGCTGCCAGA TGGTTTGAGG CCAATAGGCC GACCCGCCCCG	2817
35	ACTCTACTA TAACTGAGGA TGTGCACGG ACAGCGAATC TGGCCATCGA GCTTGACTCA	2877
	GCCACAGATG TCGGCCGGGC CTGTGCCGCG TGTCGGGTCA CCGCGGCGT TGTTCAGTAC	2937
40	CAGTTTACTG CAGGTGTGCC TGGATCCGGC AAGTCCCGCT CTATACCCA AGCCGATGTG	2997
	GACGTTGTG TGGTCCCGAC GCGTGAGTTG CGTAATGCCT GGCGCCGTCG CGGCTTTGCT	3057
	GCTTTTACCC CGCATACTGC CGCCAGAGTC ACCCAGGGGC GCCGGGTTGT CATTGATGAG	3117
45	GCTCCATCCC TCCCCCTCA CCTGCTGCTG CTCCACATGC AGCGGGCCGC CACCGTCCAC	3177
	CTTCTTGGCG ACCCGAACCA GATCCAGCC ATCGACTTTG AGCACGCTGG GCTCGTCCCC	3237
50	GCCATCAGGC CCGACTTAGG CCCACCTCC TGGTGGCATG TTACCCATCG CTGGCCTGCG	3297
	GATGTATGCG AGCTCATCCG TGGTGCATAC CCCATGATCC AGACCACTAG CCGGGTTCTC	3357
	CGTTCGTTGT TCTGGGGTGA GCCTGCCGTC GGGCAGAAAC TAGTGTTAC CCAGGCGGCC	3417
55	AAGCCCGCCA ACCCGGCTC AGTGACGGTC CACGAGGCGC AGGGCGCTAC CTACACGGAG	3477

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	ACCACTATTA TTGCCACAGC AGATGCCCGG GGCCTTATTC AGTCGTCTCG GGCTCATGCC	3537
	ATTGTTGCTC TGACGCGCCA CACTGAGAAG TCGTCATCA TTGACGCACC AGGCCTGCTT	3597
5	CGCGAGGTGG GCATCTCCGA TGCAATCGTT AATAACTTTT TCCTCGCTGG TGGCGAAATT	3657
	GGTCACCAGC GCCCATCAGT TATTCCCCGT GGCAACCCTG ACGCCAATGT TGACACCCTG	3717
10	GCTGCCTTCC CGCCGTCTTG CCAGATTAGT GCCTTCCATC AGTTGGCTGA GGAGCTTGGC	3777
	CACAGACCTG TCCCTGTTGC AGCTGTTCTA CCACCCTGCC CCGAGCTCGA ACAGGGCCTT	3837
	CTCTACCTGC CCCAGGAGCT CACCACCTGT GATAGTGTCG TAACATTTGA ATTAACAGAC	3897
15	ATTGTGCACT GCCGCATGGC CGCCCCGAGC CAGCGCAAGG CCGTGCTGTC CACACTCGTG	3957
	GGCCGCTACG GCGGTCGCAC AAAGCTCTAC AATGCTTCCC ACTCTGATGT TCGCGACTCT	4017
20	CTCGCCCGTT TTATCCCGGC CATTGGCCCC GTACAGGTTA CAACTTGTTGA ATTGTACGAG	4077
	CTAGTGGAGG CCATGGTCGA GAAGGGCCAG GATGGCTCCG CCGTCCTTGA GCTTGATCTT	4137
	TGCAACCGTG ACGTGTCAG GATCACCTTC TTCCAGAAAG ATTGTAACAA GTTACCACA	4197
25	GGTGAGACCA TTGCCCATGG TAAAGTGGG CAGGGCATCT CGGCCTGGAG CAAGACCTTC	4257
	TGCGCCCTCT TTGGCCCTTG GTTCCGCGCT ATTGAGAAGG CTATTCTGGC CCTGCTCCCT	4317
30	CAGGGTGTGT TTTACGGTGA TGCTTTGAT GACACCGTCT TCTCGGCGGC TGTGGCCGCA	4377
	GCAAAGGCAT CCATGGTGTT TGAGAATGAC TTTTCTGAGT TTGACTCCAC CCAGAATAAC	4437
	TTTTCTCTGG GTCTAGAGTG TGCTATTATG GAGGAGTGTG GGATGCCGCA GTGGCTCATC	4497
35	CGCCTGTATC ACCTTATAAG GTCTGCGTGG ATCTTGCAGG CCCCAGAGGA GTCTCTGCGA	4557
	GGGTTTTGGA AGAAACACTC CGGTGAGCCC GGCACCTTC TATGGAATAC TGTCTGGAAT	4617
40	ATGGCCGTTA TTACCCACTG TTATGACTTC CGCGATTTTC AGGTGGCTGC CTTTAAAGGT	4677
	GATGATTCGA TAGTGCTTTG CAGTGAGTAT CGTCAGAGTC CAGGAGCTGC TGTCTGATC	4737
	GCCGGCTGTG GCTTGAAGTT GAAGGTAGAT TTCCGCCCGA TCGGTTTGTA TGCAGGTGTT	4797
45	GTGGTGGCCC CCGGCCTTGG CGCGCTCCCT GATGTTGTGC GCTTCGCCGG CCGGCTTACC	4857
	GAGAAGAATT GGGGCCCTGG CCCTGAGCGG GCGGAGCAGC TCCGCCTCGC TGTTAGTGAT	4917
50	TTCCTCCGCA AGCTCACGAA TGAGCTCAG ATGTGTGTGG ATGTTGTTT CCGTGTTTAT	4977
	GGGGTTTTCC CTGGA CTGACTCGT TCATAACCTG ATTGGCATGC TACAGGCTGT TGCTGATGGC	5037
	AAGGCACATT TCACTGAGTC AGTAAACCA GTGCTCGACT TGACAAATTC AATCTTGTGT	5097
55	CGGGTGAAT GA ATAACATGTC TTTTGCTGCG CCCATGGGTT CGCGACCATG	5149

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	CGCCCTCGGC CTATTTTGTT GCTGCTCCTC ATGTTTTTGC CTATGCTGCC CGCGCCACCG	5209
5	CCCGGTCAGC CGTCTGGCCG CCGTCGTGGG CGGCGCAGCG GCGGTTCCGG CCGTGGTTTC	5269
	TGGGGTGACC GGGTTGATTC TCAGCCCTTC GCAATCCCCT ATATTCATCC AACCAACCCC	5329
	TTCGCCCCCG ATGTCACCGC TCGGGCCGGG GCTGGACCTC GTGTTGCCA ACCCGCCCGA	5389
10	CCACTCGGCT CCGCTTGGCG TGACCAGGCC CAGCGCCCCG CCGTGCCTC ACGTCTAGA	5449
	CCTACCACAG CTGGGGCCGC GCCGCTAA CCGCGGTCGC TCCGGCCCAT GACACCCCGC	5507
15	CAGTGCCTGA TGTCGACTCC CGCGGCGCCA TCTTGCCTG GCAGTATAAC CTATCAACAT	5567
	CTCCCTTAC CTCTCCGTG GCCACCGGCA CTAACCTGGT TCTTTATGCC GCCCTCTTA	5627
	GTCCGCTTTT ACCCCTTCAG GACGGCACCA ATACCCATAT AATGGCCACG GAAGCTTCTA	5687
20	ATTATGCCCA GTACCGGGTT GCCCGTGCCA CAATCCGTTA CCGCCCGCTG GTCCCAATG	5747
	CTGTCGGCGG TTACGCCATC TCCATCTCAT TCTGGCCACA GACCACCACC ACCCCGACGT	5807
25	CCGTTGATAT GAATTCAATA ACCTCGACGG ATGTTCTGAT TTTAGTCCAG CCCGGCATAG	5867
	CCTCTGAGCT TGTGATCCA AGTGAGCGCC TACACTATCG TAACCAAGGC TGGCGCTCCG	5927
	TCGAGACCTC TGGGGTGGCT GAGGAGGAGG CTACCTCTGG TCTTGTTATG CTTTGCATAC	5987
30	ATGGCTCACT CGTAAATTCC TATACTAATA CACCCTATAC CGGTGCCCTC GGGCTGTTGG	6047
	ACTTTGCCCT TGAGCTTGAG TTTGCAACC TTACCCCGG TAACACCAAT ACGCGGGTCT	6107
35	CCCGTTATTC CAGCACTGCT CGCCACCGCC TTCGTGCGG TGCGGACGGG ACTGCCGAGC	6167
	TCACCACCAC GGCTGCTACC CGCTTTATGA AGGACCTCTA TTTTACTAGT ACTAATGGTG	6227
	TCGGTGAGAT CGGCCGCGG ATAGCCCTCA CCCTGTTCAA CTTGCTGAC ACTCTGCTTG	6287
40	GCGGCCTGCC GACAGAATTG ATTTGTCGG CTGGTGGCCA GCTGTTCTAC TCCCGTCCCG	6347
	TTGTCTCAGC CAATGGCGAG CCGACTGTTA AGTTGTATAC ATCTGTAGAG AATGCTCAGC	6407
45	AGGATAAGGG TATTGCAATC CCGCATGACA TTGACCTCGG AGAATCTCGT GTGGTTATTC	6467
	AGGATTATGA TAACCAACAT GAACAAGATC GGCCGACGCC TTCTCCAGCC CCATCGCGCC	6527
	CTTCTCTGT CCTTCGAGCT AATGATGTGC TTTGGCTCTC TCTCACCCT GCGGAGTATG	6587
50	ACCAGTCCAC TTATGGCTCT TCGACTGGCC CAGTTTATGT TTCTGACTCT GTGACCTTGG	6647
	TTAATGTTGC GACCGGCGCG CAGGCCGTTG CCCGGTCGCT CGATTGGACC AAGGTCACAC	6707
55	TTGACGGTCG CCCCTCTCC ACCATCCAGC AGTACTCGAA GACCTTCTTT GTCCTGCCGC	6767
	TCCGCGGTAA GCTCTCTTC TGGGAGGCAG GCACAATAA AGCCGGGTAC CCTTATAATT	6827

5 ATAACACCAC TGCTAGCGAC CAACTGCTTG TCGAGAATGC CGCCGGGCAC CGGGTCGCTA 6887  
 TTTCCACTTA CACCACTAGC CTGGGTGCTG GTCCCGTCTC CATTTCTGCG GTTGCCGTTT 6947  
 TAGCCCCCA CTCTGCGCTA GCATTGCTTG AGGATACCTT GGACTIONCCT GCCCGCGCCC 7007  
 ATACTTTTGA TGATTTCTGC CCAGAGTGCC GCCCCCTTGG CCTTCAGGGC TCGCTTTTCC 7067  
 10 AGTCTACTGT CGCTGAGCTT CAGCGCCTTA AGATGAAGGT GGGTAAACT CGGGAGTTGT 7127  
 AG TTTATTTGCT TGTGCCCCC TTCTTTCTGT TGCTATTTT TCATTTCTGC 7179  
 GTTCCGCGCT CCCTGA 7195

15 a fourth sequence (SEQ ID NO.10):  
 GCCATGGAGG CCCACCAGT CATTAGGCT CCTGGCATCA CTACTIONCTAT TGAGCAAGCA 60  
 GCTCTAGCAG CGGCCAACTC CGCCCTTGC AATGCTGTGG TGGTCCGGCC TTTCTTTTCC 120  
 20 CATCAGCAGG TTGAGATCCT TATAAATCTC ATGCAACCTC GGCAGCTGGT GTTTCGTCCT 180  
 GAGGTTTTTT GGAATCACCC GATTCAACGT GTTATACATA ATGAGCTTGA GCAGTATTGC 240  
 25 CGTGCTCGCT CGGGTCGCTG CCTTGAGATT GGAGCCCACC CACGCTCCAT TAATGATAAT 300  
 CCTAATGTCC TCCATCGCTG CTTTCTCCAC CCCGTCGGCC GGGATGTTCA GCGCTGGTAC 360  
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 30 CCAGCCGACC GCACTTACTG TTTTGATGCG TTTGCCGGCT GCCGTTTTGC CGCCGAGACT 480  
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 35 CGCCACGGCA TGACCCGCCT TTATGCAGCT TTCCACTTGC CTCCAGAGGT GCTCCTGCCT 600  
 CCTGGCACCT ACCGGACATC ATCCTACTTG CTGATCCACG ATGGTAAGCG CGCGGTTGTC 660  
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 40 ATCAGGACAA CTAAGGTTGT GGGTGAACAC CCTTTGGTGA TCGAGCGGGT GCGGGGTATT 780  
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 45 CCTTACCCGC GTTCGACGGA GGTCTATGTC CGGTCTATCT TTGGGCCCGG CGGGTCCCCG 900  
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 TGGGACCGTC TCATGCTCTT TGGGGCCACC CTCGACGACC AGGCCTTTTG CTGCTCCAGG 1020  
 50 CTTATGACGT ACCTTCGTGG CATTAGCTAT AAGGTAAGT TGGGTGCCCT GGTGCTAAT 1080  
 GAAGGCTGGA ATGCCACCGA GGATGCGCTC ACTGCAGTTA TTACGGCGGC TTACCTCACA 1140  
 55 ATATGTCATC AGCGTTATTT GCGGACCCAG GCGATTTCTA AGGGCATGCG CCGGCTTGAG 1200

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	CTTGAACATG CTCAGAAATT TATTTACAGC CTCTACAGCT GGCTATTTGA GAAGTCAGGT	1260
	CGTGATTACA TCCCAGGCCG CCAGCTGCAG TTCTACGCTC AGTGCCGCCG CTGGTTATCT	1320
5	GCCGGGTTCC ATCTCGACCC CCGCACCTTA GTTTTTGATG AGTCAGTGCC TTGTAGCTGC	1380
	CGAACCACCA TCCGGCGGAT CGCTGGAAAA TTTTGCTGTT TTATGAAGTG GCTCGGTCAG	1440
10	GAGTGTTCTT GTTTCCTCCA GCCCGCCGAG GGGCTGGCGG GCGACCAAGG TCATGACAAT	1500
	GAGGCCTATG AAGGCTCTGA TGTGATACT GCTGAGCCTG CCACCCTAGA CATTACAGGC	1560
	TCATACATCG TGGATGGTCG GTCTCTGCAA ACTGTCTATC AAGCTCTCGA CCTGCCAGCT	1620
15	GACCTGGTAG CTCGCGCAGC CCGACTGTCT GCTACAGTTA CTGTTACTGA AACCTCTGGC	1680
	CGTCTGGATT GCCAAACAAT GATCGGCAAT AAGACTTTTC TCACTACCTT TGTTGATGGG	1740
	GCACGCCCTG AGGTAAACGG GCCTGAGCAG CTTAACCTCT CTTTTGACAG CCAGCAGTGT	1800
20	AGTATGGCAG CCGGCCCGTT TTGCCTCACC TATGCTGCCG TAGATGGCGG GCTGGAAGTT	1860
	CATTTTTCCA CCGCTGGCCT CGAGAGCCGT GTTGTTCCTC CCGCTGGTAA TGCCCCGACT	1920
25	GCCCCGCCGA GTGAGGTAC CGCCTTCTGC TCAGCTCTTT ATAGGCACAA CCGGCAGAGC	1980
	CAGCGCCAGT CGGTTATTGG TAGTTTGTGG CTGCACCCTG AAGGTTTGCT CGGCCTGTTC	2040
	CCGCCCTTTT CACCCGGGCA TGAGTGGCGG TCTGCTAACC CATTTTGCGG CGAGAGCAGC	2100
30	CTCTACACCC GCACTTGGTC CACAATTACA GACACACCCT TAACTGTCGG GCTAATTTCC	2160
	GGTCATTTGG ATGCTGCTCC CCACTCGGGG GGGCCACCTG CTA CTGCCAC AGGCCCTGCT	2220
35	GTAGGCTCGT CTGACTCTCC AGACCCTGAC CCGCTACCTG ATGTTACAGA TGGCTCACGC	2280
	CCCTCTGGGG CCGTCCGGC TGGCCCCAAC CCGAATGGCG TTCCGCAGCG CCGCTTACTA	2340
	CACACCTACC CTGACGGCGC TAAGATCTAT GTCGGCTCCA TTTTCGAGTC TGAGTGCACC	2400
40	TGGCTTGTC ACGCATCTAA CGCCGGCCAC CGCCTGGTG GCGGGCTTGT TCATGCTTTT	2460
	TTTCAGCGTT ACCCTGATTC GTTTGACGCC ACCAAGTTTG TGATGCGTGA TGGTCTTGCC	2520
45	GCGTATACCC TTACACCCCG GCCGATCATT CATGCGGTGG CCCC GGACTA TCGATTGGAA	2580
	CATAACCCCA AGAGGCTCGA GGCTGCCTAC CGCGAGACTT GCGCCCGCCG AGGCACTGCT	2640
	GCCTATCCAC TCTTAGGCGC TGGCATTAC CAGGTGCCTG TTAGTTTGAG TTTTGATGCC	2700
50	TGGGAGCGGA ACCACCGCCC GTTTGACGAG CTTTACCTAA CAGAGCTGGC GGCTCGGTGG	2760
	TTTGAATCCA ACCGCCCGG TCAGCCCAGC TTGAACATAA CTGAGGATAC CGCCCGTGCG	2820
55	GCCAACCTGG CCCTGGAGCT TGA CTCCGGG AGTGAAGTAG GCCGCGCATG TGCCGGGTGT	2880

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	AAAGTCGAGC CTGGCGTTGT GCGGTATCAG TTTACAGCCG GTGTCCCCGG CTCTGGCAAG	2940
	TCAAAGTCCG TGCAACAGGC GGATGTGGAT GTTGTGTTG TGCCCACTCG CGAGCTTCGG	3000
5	AACGCTTGGC GGGCGCCGGG CTTTGC GGCA TTTACTCCGC AACTGCGGC CCGTGTCACT	3060
	AGCGGCCGTA GGGTTGTCAT TGATGAGGCC CCTTCGCTCC CCCCACACTT GCTGCTTTTA	3120
10	CATATGCAGC GTGCTGCATC TGTGCACCTC CTTGGGGACC CGAATCAGAT CCCC GCCATA	3180
	GATTTTGAGC ACACCGGTCT GATTCCAGCA ATACGGCCGG AGTTGGTCCC GACTTCATGG	3240
	TGGCATGTCA CCCACCGTTG CCTGCAGAT GTCTGTGAGT TAGTCCGTGG TGCTTACCCT	3300
15	AAAATCCAGA CTACAAGTAA GGTGCTCCGT TCCCTTTTCT GGGGAGAGCC AGCTGTGCGC	3360
	CAGAAGCTAG TGTTACACA GGCTGCTAAG GCCGCGCACC CCGGATCTAT AACGGTCCAT	3420
	GAGGCCAGG GTGCCACTTT TACCACTACA ACTATAATTG CAACTGCAGA TGCCCGTGGC	3480
20	CTCATACAGT CCTCCGGGGC TCACGCTATA GTTGCTCTCA CTAGGCATAC TGAAAAATGT	3540
	GTTATACTTG ACTCTCCCGG CCTGTTGCGT GAGGTGGGTA TCTCAGATGC CATTGTTAAT	3600
25	AATTTCTTCC TTTCGGGTGG CGAGGTTGGT CACCAGAGAC CATCGGTCAT TCCGCGAGGC	3660
	AACCTGACC GCAATGTTGA CGTGCTTGCG GCGTTTCCAC CTTTCATGCCA AATAAGCGCC	3720
	TTCCATCAGC TTGCTGAGGA GCTGGGCCAC CGGCCGGCGC CGGTGGCGGC TGTGCTACCT	3780
30	CCCTGCCCTG AGCTTGAGCA GGGCCTTCTC TATCTGCCAC AGGAGCTAGC CTCCTGTGAC	3840
	AGTGTTGTGA CATTTGAGCT AACTGACATT GTGCACTGCC GCATGGCGGC CCCTAGCCAA	3900
35	AGGAAAGCTG TTTTGTCCAC GCTGGTAGGC CGGTATGGCA GACGCACAAG GCTTTATGAT	3960
	GCGGGTCACA CCGATGTCCG CGCCTCCCTT GCGCGCTTTA TTCCCACTCT CGGGCGGGTT	4020
	ACTGCCACCA CCTGTGAACT CTTTGAGCTT GTAGAGGCGA TGGTGGAGAA GGGCCAAGAC	4080
40	GGTTCAGCCG TCCTCGAGTT GGATTTGTGC AGCCGAGATG TCTCCGCAT AACCTTTTTT	4140
	CAGAAGGATT GTAACAAGTT CACGACCGGC GAGACAATTG CGCATGGCAA AGTCGGTCAG	4200
45	GGTATCTTCC GCTGGAGTAA GACGTTTTGT GCCCTGTTTG GCCCTGGTT CCGTGCGATT	4260
	GAGAAGGCTA TTCTATCCCT TTTACCACAA GCTGTGTTCT ACGGGGATGC TTATGACGAC	4320
	TCAGTATTCT CTGCTGCCGT GGCTGGCGCC AGCCATGCCA TGGTGTGTTGA AAATGATTTT	4380
50	TCTGAGTTTG ACTCGACTCA GAATAACTTT TCCCTAGGTC TTGAGTGCGC CATTATGGAA	4440
	GAGTGTGGTA TGCCCCAGTG GCTTGTGAGG TTGTACCATG CCGTCCGGTC GGC GTGGATC	4500
55	CTGCAGGCC CAAAAGAGTC TTTGAGAGGG TTCTGGAAGA AGCATTCTGG TGAGCCGGGC	4560

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	AGCTTGCTCT GGAATACGGT GTGGAACATG GCAATCATTG CCCATTGCTA TGAGTTCCGG	4620
	GACCTCCAGG TTGCCGCCCTT CAAGGGCGAC GACTCGGTCG TCCTCTGTAG TGAATACCGC	4680
5	CAGAGCCCAG GCGCCGGTTC GCTTATAGCA GGCTGTGGTT TGAAGTTGAA GGCTGACTTC	4740
	CGGCCGATTG GGCTGTATGC CGGGGTTGTC GTCGCCCCGG GGCTCGGGGC CCTACCCGAT	4800
	GTCGTTGAT TCGCCGGACG GCTTTCGGAG AAGAACTGGG GGCCTGATCC GGAGCGGGCA	4860
10	GAGCAGCTCC GCCTCGCCGT GCAGGATTTT CTCCGTAGGT TAACGAATGT GGCCAGATT	4920
	TGTGTTGAGG TGGTGTCTAG AGTTTACGGG GTTCCCCGG GTCTGGTTCA TAACCTGATA	4980
15	GGCATGCTCC AGACTATTGG TGATGGTAAG GCGCATTTTA CAGAGTCTGT TAAGCTATA	5040
	CTTGACCTTA CACACTCAAT TATGCACCGG TCTGAATGAA TAACATGTGG TTTGCTGCGC	5100
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20	TATGTTGCC GCGCCACCGA CCGGTCAGCC GTCTGGCCGC CGTCGTGGGC GCGCAGCGG	5220
	CGGTACCGGC GGTGGTTTCT GGGGTGACCG GGTGATTCT CAGCCCTTCG CAATCCCCTA	5280
25	TATTCATCCA ACCAACCCTT TTGCCCCAGA CGTTGCCGCT GCGTCCGGGT CTGGACCTCG	5340
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30	TGCCATGAC ACCTCACCCG TCCGGACGT TGATTCTCG GGTGCAATTC TACGCCGCA	5520
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35	GTATGCAGCC CCCCTTAATC CGCCTCTGCC GCTGCAGGAC GGTACTAATA CTCACATTAT	5640
	GGCCACAGAG GCCTCCAATT ATGCACAGTA CCGGGTTGCC GCGCTACTA TCCGTTACCG	5700
	GCCCCTAGTG CCTAATGCAG TTGGAGGCTA TGCTATATCC ATTTCTTTCT GGCCTCAAAC	5760
40	AACCACAACC CCTACATCTG TTGACATGAA TTCCATTACT TCCACTGATG TCAGGATTCT	5820
	TGTTCAACCT GGCATAGCAT CTGAATTGGT CATCCCAAGC GAGCGCCTTC ACTACGCAA	5880
45	TCAAGGTTGG CGCTCGGTTG AGACATCTGG TGTGCTGAG GAGGAAGCCA CCTCCGTTCT	5940
	TGTCATGTTA TGCATACATG GCTCTCCAGT TAACTCCTAT ACCAATACCC CTTATACCGG	6000
	TGCCCTTGGC TTAAGGACT TTGCCTTAGA GCTTGAGTTT CGCAATCTCA CCACCTGTAA	6060
50	CACCAATACA CGTGTGTCCC GTTACTCCAG CACTGCTCGT CACTCCGCCC GAGGGGCCGA	6120
	CGGGACTGCG GAGCTGACCA CAACTGCAGC CACCAGGTTC ATGAAAGATC TCCACTTTAC	6180
55	CGGCCTTAAT GGGGTAGGTG AAGTCGGCCG CGGGATAGCT CTAACATTAC TTAACCTTGC	6240

	TGACACGCTC CTCGGCGGGC TCCCGACAGA ATTAATTTTCG TCGGCTGGCG GGCAACTGTT	6300
	TTATTCCCGC CCGGTTGTCT CAGCCAATGG CGAGCCAACC GTGAAGCTCT ATACATCAGT	6360
5	GGAGAATGCT CAGCAGGATA AGGGTGTTC TATCCCCAC GATATCGATC TTGGTGATTC	6420
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10	TGCGCCATCT CGGCCTTTT CTGTTCTCCG AGCAAATGAT GTACTTTGGC TGTCCCTCAC	6540
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	CAGCGTGACT TTGGTGAATG TTGCGACTGG CGCGCAGGCC GTAGCCCGAT CGCTTGACTG	6660
15	GTCCAAAGTC ACCCTCGACG GCGGGCCCT CCCGACTGTT GAGCAATATT CCAAGACATT	6720
	CTTTGTGCTC CCCCTTCGTG GCAAGCTCTC CTTTGGGAG GCCGGCACAA CAAAAGCAGG	6780
20	TTATCCTTAT AATTATAATA CTA CTGCTAG TGACCAGATT CTGATTGAAA ATGCTGCCGG	6840
	CCATCGGGTC GCCATTTCAA CCTATACCAC CAGGCTTGGG GCCGGTCCGG TCGCCATTTT	6900
	TGCGGCCGCG GTTTTGGCTC CAGCTCCGC CCTGGCTCTG CTGGAGGATA CTTTGTGATTA	6960
25	TCCGGGGCGG GCGCACACAT TTGATGACTT CTGCCCTGAA TGCCGCGCTT TAGGCCTCCA	7020
	GGGTTGTGCT TTCCAGTCAA CTGTCGCTGA GCTCCAGCGC CTAAAGTTA AGGTGGGTAA	7080
30	AACTCGGGAG TTGTAGTTTA TTTGGCTGTG CCCACCTACT TATATCTGCT GATTTCTTTT	7140
	ATTTCTTTT TCTCGGTCCC GCGCTCCCTG A	7171
	or a fifth sequence (SEQ ID NO.12):	
35	CGGGCCCCGT ACAGGTCACA ACCTGTGAGT TGTACGAGCT AGTGGAGGCC ATGGTCGAGA	60
	AAGGCCAGGA TGGCTCCGCC GTCCTTGAGC TCGATCTCTG CAACCGTGAC GTGTCCAGGA	120
	TCACCTTTTT CCAGAAAGAT TGCAATAAGT TCACCACGGG AGAGACCATC GCCCATGGTA	180
40	AAGTGGGCCA GGGCATTTCG GCCTGGAGTA AGACCTTCTG TGCCCTTTTC GGCCCTGGT	240
	TCCGTGCTAT TGAGAAGGCT ATTCTGGCCC TGCTCCCTCA GGGTGTGTTT TATGGGGATG	300
45	CCTTTGATGA CACCGTCTTC TCGGCGCGTG TGGCCGAGC AAAGGCGTCC ATGGTGTGTTG	360
	AGAATGACTT TTCTGAGTTT GACTCCACCC AGAATAATTT TTCCCTGGGC CTAGAGTGTG	420
	CTATTATGGA GAAGTGTTGG ATGCCGAAGT GGCTCATCCG CTTGTACCAC CTTATAAGGT	480
50	CTGCGTGGAT CCTGCAGGCC CCGAAGGAGT CCCTGCGAGG GTGTTGGAAG AAACACTCCG	540
	GTGAGCCCGG CACTCTTCTA TGAATACTG TCTGGAACAT GGCCGTATC ACCCATTTGT	600
55	ACGATTTCCG CGATTTGCAG GTGGCTGCCT TTAAAGGTGA TGATTCGATA GTGCTTTGCA	660
	GTGAGTACCG TCAGAGTCCA GGGGCTGCTG TCCTGATTGC TGGCTGTGGC TTAAAGCTGA	720



AGGTGGGTTT CCGTCCGATT GGTTTGATG CAGGTGTTGT GGTGACCCCC GGCCTTGGCG 780  
 CGCTTCCCGA CGTCGTGCGC TTGTCCGGCC GGCTTACTGA GAAGAATTGG GGCCCTGGCC 840  
 CTGAGCGGGC GGAGCAGCTC CGCCTTGCTG TGCG 874

or a sequence complementary thereto.

10 14. A kit comprising, in a container or separate  
 containers, a pair of single-strand primers derived  
 from nonhomologous regions of opposite strands of a  
 DNA duplex fragment derived from an enterically  
 transmitted viral hepatitis agent whose genome  
 15 contains a region which is homologous to the 1.33 kb  
 DNA EcoRI insert present in plasmid pTZKF1(ET1.1)  
 carried in E. coli strain BB4 and having ATCC deposit  
 no. 67717.

20 15. The kit of claim 15, which are derived from  
 opposite strands of the EcoRI duplex insert in said  
 plasmid.

25 16. A method for detecting the presence of an  
 enterically transmitted nonA/nonB hepatitis viral  
 agent in a biological sample, comprising  
 preparing a mixture of duplex DNA fragments  
 derived from the sample,  
 denaturing the duplex fragments,  
 30 adding to the denatured DNA fragments, a pair of  
 single-strand primers derived from nonhomologous  
 regions of opposite strands of a DNA duplex fragment  
 derived from an enterically transmitted viral  
 hepatitis agent whose genome contains a region which  
 35 is homologous to the 1.33 kb DNA EcoRI insert present  
 in plasmid pTZKF1(ET1.1) carried in E. coli strain  
 BB4, and having ATCC deposit no. 67717,  
 hybridizing said primers to homologous-sequence  
 region of opposite strands of such duplex DNA

fragments derived from enterically transmitted nonA/nonB hepatitis agent,

reacting the primed fragment strands with DNA polymerase in the presence of DNA nucleotides, to form new DNA duplexes containing the primer sequences, and repeating said denaturing, adding, hybridizing and reacting steps, until a desired degree of amplification of sequences is achieved.

17. The method of claim 16, wherein the primers are derived from opposite strands of the EcoRI duplex insert in said plasmid.

18. The method of claim 16, for detecting the presence of viral agent in a sample of cultured cells infected with the agent.

19. A vaccine for immunizing an individual against enterically transmitted nonA/nonB hepatitis viral agent comprising, in a pharmacologically acceptable adjuvant, a recombinant protein derived from an enterically transmitted nonA/nonB viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZ-RF1(ET1.1) carried in E. coli strain BB4, and having ATCC deposit no. 67717.

20. The vaccine of claim 19, wherein the protein is derived from the EcoRI insert in said plasmid.

21. A vaccine for immunizing an individual against HEV comprising, in a pharmacologically acceptable adjuvant, a protein encoded by genetic sequence 406.3-2 or 406.4-2 or a fragment thereof.

22. In a method of isolating an enterically transmitted nonA/nonB viral agent or a nucleic acid fragment produced by the agent, an improvement which

comprises: utilizing, as a source of said agent, bile obtained from a human or cynomolgus monkey having an active infection of enterically transmitted non-A/non-B hepatitis.

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23. The method of claim 22, wherein the bile is obtained from an infected cynomolgus monkey.

24. Human polyclonal anti-serum obtained from a human immunized with a protein derived from an enterically transmitted non-A/non-B viral hepatitis agent whose genome contains a region which is homologous to the 1.33 kb DNA EcoRI insert present in plasmid pTZKF1(ET1.1) carried in E. coli strain BB4 and having ATCC deposit no. 67717.

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